by L. JAY ATKINSON

Long-Term Influences Affecting the Volume of New Housing Units

THIS article, the first part of a study of residential construction, provides alternative projections of the number of housing units to be constructed at about the end of the decade—around 1970. Attention is focused upon the number of housing units. The problem of the composition of the new units and their valuation is reserved for a subsequent report.[1]

The general technique used here to estimate new housing construction in future years begins with projections of households, which are equivalent to occupied housing units. To these is added a projection of vacant units. By definition, occupied plus vacant units equal the total housing stock. Changes in the stock, plus an estimate of removals, yield projections of the number of housing units to be constructed.

The first and longest section is concerned with estimates of the number of past and future households, and an analysis of the influences affecting household formation. The discussion centers around the latest projections of the Bureau of the Census. An attempt is made to distinguish between the direct effects of population growth, on the one hand, and of those factors which have caused households to increase in relation to the adult population. A review is made of the relevant data from the Bureau of the Census, following in broad outline the Census method of projecting households.[2] This involves, first a projection of total and adult population and its marital status, and second, the proportion of adults in these groups who become household heads. After the detailed examination of the two current Census projections, a third—higher—alternative for the decade of the 1970's is added.

In the second section the transition is made from the number and type of households to new residential construction by making projections of (1) changes in vacant units, and (2) removal of housing units from the housing stock.

We are concerned with long-term influences which will be operative at about the end of this decade, rather than with the short-term cyclical influences which may strongly affect any specific year. Accordingly, the analysis deals with conditions prevailing over a period of years centering on 1970. The estimate for 1970 represents an average of the 5-year periods on either side of that year.

Some assumptions and limitations

Housing construction, like fixed investment generally, is not only a determinant of the level of economic activity but is also dependent upon it. The housing projections presented here are not based on specific assumed levels of income and other relevant economic variables, principally because it was not possible to develop usable relationships between them and the available housing data. The projections assume high levels of prosperity. In general, the alternatives are consistent with a range of economic conditions varying from a continuation of the historical average rate of growth in total output to a somewhat faster growth. Adequate financing for residential construction, no major changes in the relative price of housing, and sufficient flexibility in the construction industry to meet the demand for new housing units are implicit in the projections.

The limitations of statistics in the housing field have been so frequently noted that little further elaboration seems necessary here. Since housing starts are the ultimate objective of this study it would have been desirable to develop some functional relationship between starts and the many factors that affect their long-run behavior. Data on housing starts have not been directly employed in making the projections, however, because of uncertainties attached to their level and movement from the end of World War II to 1959, when the new Census series was initiated. Even the data on households show certain inconsistencies (as indicated in table 1, for instance), depending on whether the Census of Housing or the Current Population Survey is used. General evidence of underenumeration in varying degrees and of the influence of changes in definition could seldom be incorporated

1. This research in the housing field has been undertaken as a part of an Interagency Study of Growth in the United States, but this article has not been reviewed by the steering committee of the Growth Project.

2. As is clearly evident, most of the statistics used in this report and the methodology of Part I are from the U.S. Department of Commerce, Bureau of the Census. In addition, special information and helpful interpretations have been obtained from various statisticians of the Bureau. Mr. Robert Parke, Jr. of the Population Division has been especially helpful.

into the analysis for lack of appropriate detail; moreover, most of the historical data used here are subject to sampling errors.

Summary of principal findings

The summary calculations of projected new housing units are presented in table 1. Three sets of projections are given embodying the three household projections considered—the two Census series and the higher alternative. For each household projection there is a corresponding projection of vacancies and losses. For any given set the sum of the three components gives an estimate of units to be provided through new construction. Data are shown for the period 1965–75. The projection for 1970 is shown as the average for this 10-year period.

1. Under varying assumptions consistent with continued high levels of prosperity, the number of new housing units projected for the end of this decade ranges from a 1.66 million annual rate to an intermediate estimate of 1.85 million and a high of 2.12 million annual rate. The latter figure is consistent with a rate of economic growth faster than the historical average. These projections may be compared with an annual average of 1.4 million total housing starts for the period 1960 to date.[3]

2. According to the intermediate projection of 1.85 million units per year, 1.14 million units are estimated for net household formation, 550,000 to replace units removed from the inventory, and 160,000 to provide for a rise in vacancies, including seasonal (vacation) homes.

3. Household growth is expected to contribute from a little over 1 million to approximately 1½ million new units, depending on the particular projection used.

4. Household growth may be partitioned into (a) population effect, resulting from an increase in the number of adults in the various age-groups, and (b) other effects, such as changes in marriage rates and changes in the tendency of adults in the various age-groups to maintain households.

The population effect has been smaller in the years since 1950 than in the 1940's. It will pick up after 1965 and become strong by 1970, reflecting the upsurge in births starting in World War II. The number of adults 21 years and over increased 11 million in the decade 1950–60, but is expected to increase 20 million from 1965 to 1975.

Effects other than population, which are related in large measure to economic conditions, have been especially important in the past two decades; they accounted for about one-third of the household growth between 1950 and 1960. Since the population effects for a considerable period in the future are largely determined by the present age distribution of the population, the principal differences between the household projections are attributable to nonpopulation influences.

5. Provision for vacant units will result in a small increase in housing construction in the 1965–75 decade, reflecting in part the increase in vacation homes.

6. Removals of units from the housing inventory (the replacement market) are projected from data in the 1950–60 decade. During the years 1950–56, the rate (on a decade basis) was 5.2 percent. It rose to 8½ percent for 1957–59, and is assumed to continue at this rate in the 1960's and 1970's. Demand from this source constitutes a significant part—roughly 30 percent—of projected new housing estimates.

Table 1.—New Housing Units: Summary of Components, Actual and Projected

[Million units]

	Actual 1950–60	Projection 1965–75	
		Total	Annual rate
1. Increase in households (Housing Census)	10.1	.....	.....
2. Increase in households (Current Population Survey)	9.1	.....	.....
3. Census "A"	.....	11.4	1.14
4. Census "B"	.....	10.5	1.05
5. Alternate	.....	13.4	1.34
6. Increase in vacancies (Housing Census)	2.3	.....	.....
7. Census "A"	.....	1.6	.16
8. Census "B"	.....	1.1	.11
9. Alternate	.....	1.9	.19
10. Increase in housing inventory (line 1 + line 6)	12.4	.....	.....
11. Increase in housing inventory (line 2 + line 6)	11.4	.....	.....
Projections:			
12. Using Census "A"	.....	13.0	1.30
13. Using Census "B"	.....	11.6	1.16
14. Using Alternate	.....	15.3	1.52
15. Losses (Housing Census)	3.0	.....	.....
16. Census "A"	.....	5.5	.55
17. Census "B"	.....	5.0	.50
18. Alternate	.....	6.0	.60
19. New housing units constructed			
20. Actual	15.5	.....	.....
21. Projected, based on			
22. Census "A" (line 12 + line 16)	.....	18.5	1.85
23. Census "B" (line 13 + line 17)	.....	16.6	1.66
24. Alternate (line 14 + line 18)	.....	21.2	2.12

Source: U.S. Department of Commerce, Office of Business Economics, based largely on data from Bureau of the Census.

Part I.—Population Growth and Number of Households

WHAT are the main long-run influences that govern the number of households? An obvious factor would appear to be population, more specifically, the number of adults, since marriage and household formation occur in early adult life. Income would seem to be another influence since inadequate income may delay the decision of younger persons to marry and establish households, and of older people—married and widowed—to maintain a separate household. Income also strongly affects the quality of housing demanded, but the quality of housing is not considered in this article. Moderate changes in the price of housing (including rent) and the availability and cost of credit probably exert relatively little effect on household formation, though, as with income, they may be relevant to the replacement market and they seem clearly pertinent to the kind of housing accommodations demanded.

3. The projections, unlike the housing starts, include those trailers which are classified as households. Such units were in the neighborhood of 50,000 per year in the decade 1950–60.

Investigators who have attempted a systematic analysis of long-term changes in the number of households have found that population change, taking into account the age and sex distribution, explained almost all of the change in household formation for the period 1890 to 1947.[4]

The estimated number of households, measured at intervals of a decade, has shown continuous growth, even over a relatively depressed period like the 1930's. The data shown in the text table below, which give net changes in the number of households in the first six decades of this century, suggest that even the Great Depression had the effect merely of slowing down household formation.

	(*Millions*)
1900–10	4.6
1910–20	4.3
1920–30	5.6
1930–40	5.1
1940–50	8.6
1950–60	9.1

Total population—past and future growth

We start, then, with a consideration of changes in the adult population, but by way of background first take up changes in the total population. The past pattern of total population growth, illustrated in the first chart, is a familiar one: Growth was high in the initial two decades of the present century, it slackened in the late 1920's and fell off more markedly in the early 1930's. Then followed a small rise in the late 1930's, a sharp pickup during the war, and a high rate of advance since then that has only edged off a bit in the past few years. During the decades of the 1940's and the 1950's, the rapid growth in the population was rather steady, at an average annual rate of 1.6 percent. This resulted in an increase in the total population from 132 million in 1940 to 181 million in 1960, a rise of 37 percent.

The Bureau of the Census has made several projections of the population increase in the next two decades. The alternative projections differ primarily because of assumed differences in the birth rate, but these differences are not of importance for household projections over the next decade or so. References to total population in this report are based on Series III.[5]

Between 1960 and 1980 the total population is projected to grow from 181 million to 246 million, an increase of 36 percent. Within this 20-year span, the projected absolute increases for each of the two decades are 28 million and 37 million as against 19 million (1940–50) and 30 million (1950–60).

Adult population

For the purpose of this study, the growth in adult population is of special interest. The number of housing units required is more directly related to the number of adults to be housed, and is not likely to be much affected by variations in the number of children. For the problem at hand—a 1970 estimate—this has the practical advantage of avoiding a projection of the birth rate.

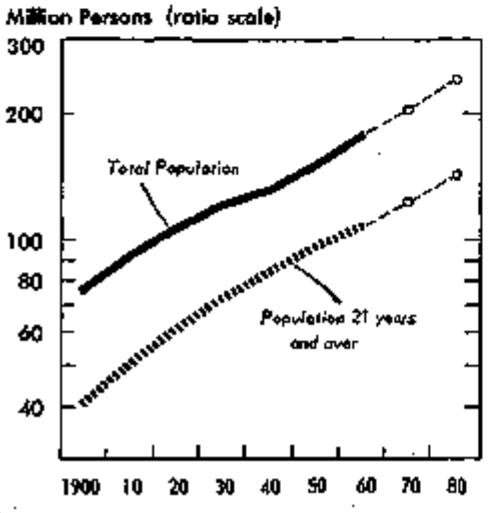
In the early part of this century, the relative growth rate of the adult population exceeded that of the total population, largely because both rates were showing historical downtrends, and adult rate changes tend to lag the total by two decades. The difference between the two rates of growth was accentuated in the 1930's when total population growth dropped considerably whereas adult population growth was not immediately affected. The subsequent retardation in the adult growth rate occurred between 1950 and 1960, when it was appreciably

4. See, Sherman Maisel "Fluctuations in Residential Construction Starts," *American Economic Review*, June, 1963 pp. 359-83 and citations.

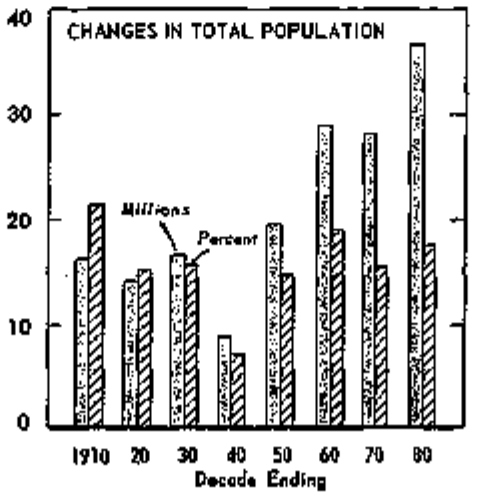
5. For about 2 years the birth rate has been edging downward. This suggests that the long-awaited postwar downturn in the birth rate may now be appearing. Such an assumption is made in the Census III population projection.

TOTAL AND ADULT POPULATION

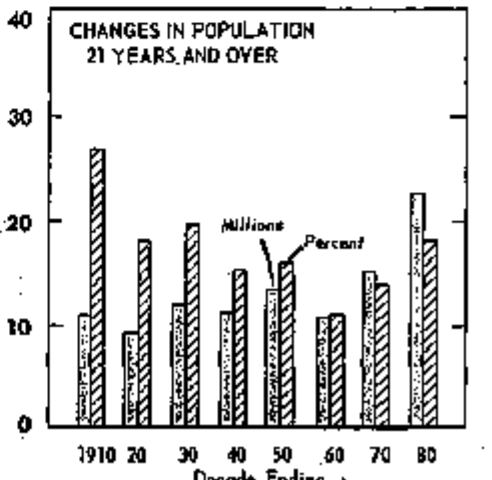
Little Difference Projected in Growth Rate of Total and Adult Population in the 1960's and 1970's



Sharp Drop in Population Growth 1930-40 Followed by Marked Pickup



Adult Population Growing by 1 1/2 Percent Annually in This Decade, After Lull in 1950's



U.S. Department of Commerce, Office of Business Economics

Basic Data: Census

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Table 2.—U.S. Population Age 20 and Over: Actual 1930–60, and Census Projections, 1965–80, by Selected Age Groups

[Millions]

	1930	1940	1950	1965	1960	1965	1970	1975	1980
20 and over, total	75.1	88.4	99.6	105.3	115.2	117.8	127.0	138.7	150.8
20–24	10.9	11.6	11.5	10.3	11.1	13.6	12.1	13.0	20.5
25–29	9.3	11.1	12.2	11.7	11.0	11.2	13.7	17.2	19.1
30–34	9.1	10.2	11.6	12.4	12.0	11.1	11.4	13.8	17.3
35–44	17.2	18.3	21.5	22.8	24.3	24.5	23.1	22.5	25.2
45–64	21.4	26.1	30.6	33.4	36.2	39.2	42.3	44.1	44.2
65 and over	6.6	9.0	12.3	14.1	16.7	18.2	20.0	22.0	24.5

Note: 1930, 1940, and 1950 are decennial Census data, April 1, and do not include armed forces overseas. Beginning 1955, the data include armed forces and are as of July 1. Alaska and Hawaii are included for years 1950–80.

Source: U.S. Department of Commerce, Bureau of the Census.

lower in relation to total population than in the preceding decades of this century.

For the period of a decade or so hence the number of adults can be projected with considerable accuracy, since those who will become adults during this interval are already born, and mortality rates can be projected with little uncertainty. Accordingly, only a single projection of this age group has been made by the Census up to 1980, and it is shown in chart 1. It may be noted that the adult population in 1970 is equivalent to (1) the current population excluding children below teen-ages; minus (2) deaths in the years ahead; plus (3) net immigration from abroad. For 1980 the adult population can also be accurately estimated at present. The projected adult population is not dependent to any important extent on what happens to income or other economic variables in the next several years. Since population not in households is relatively small and has a stable pattern, this element does not contain any appreciable uncertainty that requires specific attention.

The strong increase in the adult population which impends—and is now just beginning—reflects the increased birth rate that began about World War II and has continued until recently. Viewed against the experience of the 1950's, when the number of adults (21 years and over) rose by only 11 million, the projected pickup in the period ahead appears quite striking. From 1960 to 1970, the adult population is expected to rise by a record 15 million, and from 1970 to 1980 by another 23½ million. These are indeed large changes, which provide a favorable basis for household growth in the next decade or two. Recent and prospective changes in the adult population by age brackets are brought out in table 2.

Household growth and adult population

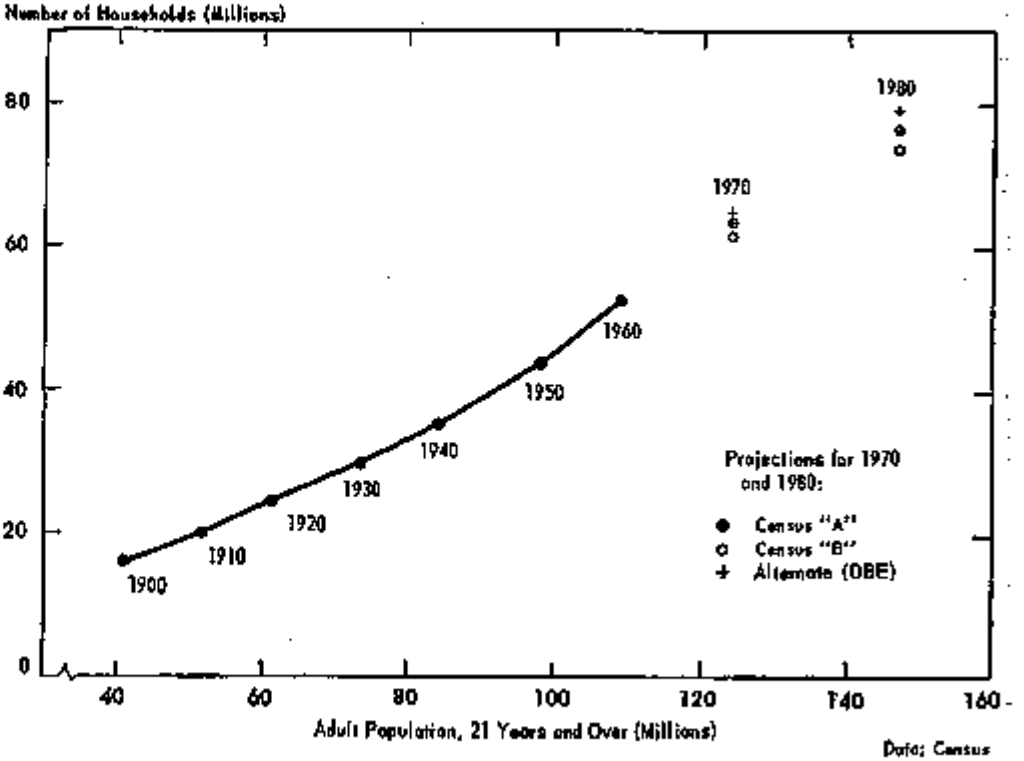
A few remarks pertaining to definitions, and some examples, will facilitate the succeeding discussion. The Census Bureau defines a household as the person or group of persons who occupy a house, apartment, or other space that constitutes a housing unit. By definition, the number of households is thus equal to the number of occupied housing units.[6] Each household contains a primary family or a primary individual; some family households may contain more than a single family. The additional family within a household is designated a "secondary family" if its members are unrelated to the primary group, or a "subfamily" if related. A primary individual household is one with a single person (e.g., a widow, a divorced person) or with two or more unrelated persons. An unrelated individual who is not the head of a household is termed a "secondary individual." The number and type of households in the United States in March 1963 were as follows:

Households	Number (millions)
Total	63.2
Primary families	48.8
Husband-wife	40.8
Other male head	1.8
Female head	4.7
Primary individuals	8.4
Male	2.8
Female	5.5

6. Prior to 1960, the term "dwelling unit" was used by the Census. Housing units include a small number of living quarters which had not been classified as dwelling units under the old definition.

RELATION BETWEEN NUMBER OF HOUSEHOLDS AND ADULT POPULATION

Since 1940 Households Have Grown Much Faster Than Adult Population



Data: Census

U.S. Department of Commerce, Office of Business Economics

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Up to 1940, at least, the relationship between the number of households and the total number of adults suggested this: On the average, for every 10 million increase in adult population, the number of households increased by some 4½ million. Since then, however, the growth in households has been substantially greater than indicated by the pre-World War II relationship with adult population: Accompanying a 25-million rise in adult population from 1940 to 1960 there was an 18-million increase in households (see chart on page 11). Very briefly, changes in the household-adult population relationship have reflected two developments. For the decade 1940–50, there was a sharp increase in the proportion of adults who married, and for the 1950–60 period, a marked rise in nonfamily households. Because both are important and have emerged at different times, they are treated separately in some detail.

Marital Status

From 1900 to 1940 there was little long-term change in the proportion of total males or females who were married, if allowance is made for changes in age distribution. The principal change since 1940 has been an increase in the proportion married for young adults, as can be seen in the chart on this page which shows the percent of males "married, spouse present" for each age group.

The first impression of this picture is the unusually large increase that occurred from 1940 to 1950 for the younger age groups. For the entire adult male population, the percent married rose from 60 to 65½ between 1940 and 1950, and the proportion single declined from 35 percent to 29 percent during the same period.[7]

As can be seen, these are very large shifts in marital status. Since households are established in most instances within a few months after marriage, the large advance in the proportion of the adult population married during this decade was accompanied by an unusually large increase in husband-wife households. The rise was 7.4 million, as compared with 3.1 million in the preceding decade, despite the fact that the increase in the adult population was only a little larger in the 1940's than in the 1930's.

It is important to note that the larger increase in households in the 1940's than in the preceding decade was not attributable to any significant "undoubling." While there was considerable doubling and undoubling within the decade, the total of 2 million husband-wife families doubled up in 1950 was about the same as in 1940.

By way of contrast, during the 1950's the marital status of the population showed little further change. Except for persons 65 and over, the proportion married among most age groups changed very slightly from 1950 to 1960. The small change that is evident was in the same direction as in the preceding decade.

Census projections of marital status

The two projections of households utilized in this report, designated as "A" and "B", are the latest series prepared by the Bureau of the Census and issued in April of this year. They are revisions of the two higher series of the four projections which had been made in 1958.[8] The household projections are based upon and embody a considerable amount of detailed information pertaining to projections of the population, of marital status, and of the proportion of married and single persons who become household heads.

For both the Census projections a substantial increase in the proportion of the population married is assumed for the younger age groups. Thus, for the "A" or higher Census projection, the proportion of males age 20–24 who are "married, with spouse present" rises from 43 percent in 1960 to 48 percent in 1975. For the 20- to 29-year old males the corresponding figures are 73 percent and 76 percent; small increases are projected for age groups 30–64. The changes in marital status are nearly as large for the "B" assumption. The influence of the change in marital status upon the number of projected households is indicated by some computations derived from the Bureau of the Census projections. According to the "A" series projection, for example, about 3 million husband-wife households in 1975 and 4 million in 1980 are attributable to the increased proportion married in each age-sex group as compared with 1960.

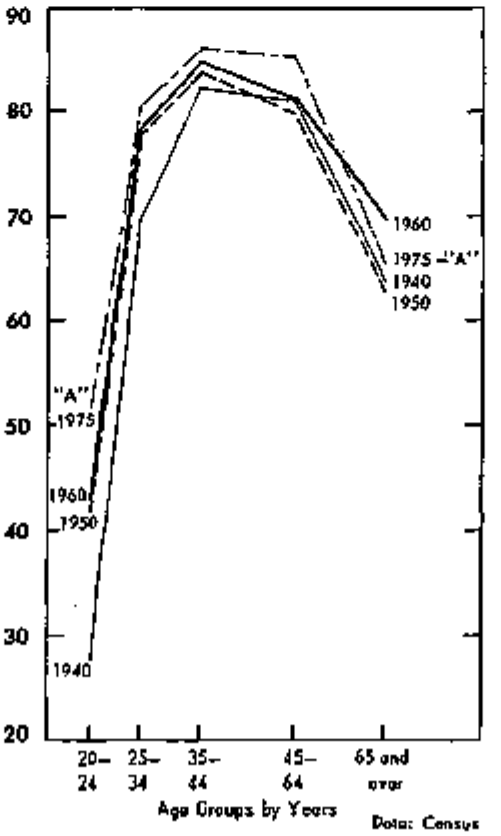
In preparing the projections of the percent married in each age group after 1960 the Census Bureau made use of trends in this proportion from approximately 1949–51 to 1956–58. Thus the unusually sharp rise from 1940 to 1950 for the age groups under age 35 did not enter into the projections although a smaller increase—from 1950 to 1957—is embodied in them.

Although most men get married, low income acts as a deterrent to marriage. This is suggested by a special Bureau of the Census breakdown of the income and marital status of men aged 35 to

MARITAL STATUS OF ADULT MALES

- Substantial Increase in Proportion Married in Young Age Groups Since 1940
- Further Rise In Ratio Projected to 1975

Married males with spouse present as a % of all males by age groups



Data: Census

U.S. Department of Commerce, Office of Business Economics 63-11-6

7. Excludes widowed and divorced persons. Ratios are standardized for age, based on the 1940 age distribution as standard. Source: Bureau of the Census, Current Population Reports, P–20 No. 72.

8. The revisions include the addition of Alaska and Hawaii, changes in the age structure of the population projections occasioned by the 1960 Census, and increases in male primary individual households, reflecting recent developments. The 1963 revisions did not involve significant changes in family households. See Current Population Reports P–20 No. 90 for basic methodology and P–20 No. 128 for the method of revision.

64, with age and education held constant.

Income, 1959	Percent of men ever married
Under $4,000	85
$4,000–$6,999	95
$7,000 and over	97

Rising incomes and the existence of a large volume of accumulated savings were probably important factors in the increase in the married proportion of very young adult males from 1940 to 1950. The 1950 figure may have been somewhat high because of special influences associated with the demobilization and the very early postwar period; the number of marriages was unusually large in 1945–47. This could help explain the smaller increase in the married proportion from 1950 to 1960 but in any case some retardation in the rapid rise in the preceding decade was to be expected. Since income effects have been important in causing this ratio to rise in the postwar period—mainly because of the ready availability of job opportunities for both husband and wife—the projected rise in the ratio through the 1960's and 1970's appears reasonable.

Census projections of family households

Given the number of married persons, by age and sex, the Census procedure then involved an estimate of the proportion in each group that would become household heads. Very briefly the method made use of changes in the ratio of household heads to the number of married persons from 1950 to 1956–58. In all cases decreasing rates of changes were introduced after 1965, although for family households the projected slowdown had only a small effect.

Despite the tapering off in the rates of increase in several elements of the projections, the larger classes reaching adulthood result in progressively larger increments by 5-year intervals for both the "A" and "B" series projections. The higher husband-wife series yields a 700,000 per annum advance from 1960 to 1970, and a 920,000 per annum increase over the succeeding decade. These changes may be compared with actual annual increases of 750,000 in the 1940's and 520,000 in the 1950's. (See table 3, which also provides estimates of households other than those of husband and wife.)

Households of Primary Individuals

To view recent household formation solely in terms of husband-wife house-

Table 3.—Number of Households and Annual Change, by Type of Household: Actual 1940–60 and Census Projections, 1965–80

[Millions]

	Total households			Family						Primary individual		
		Projections		Husband-wife			Other				Projections	
	Actual	"A"	"B"	Actual	Projections "A"	Projections "B"	Actual	Projections "A"	Projections "B"	Actual	"A"	"B"
1940	34.9			28.6			4.9			3.5		
1950	43.6			34.1			4.8			4.7		
1960	52.6			39.3			5.6			7.8		
1965		58.6	57.2		42.6	41.8		6.2	6.3		9.8	9.1
1970		63.9	62.0		46.2	45.4		6.6	6.6		11.1	10.0
1975		70.0	67.7		50.8	49.6		7.0	7.1		12.5	11.0
1980		76.5	73.6		55.4	54.2		7.4	7.6		13.6	11.8
Annual change												
1940–50	.84			.75			−.02			.13		
1950–60	.91			.52			.08			.30		
1960–65		1.21	.92		.66	.51		.13	.13		.42	.27
1965–70		1.06	.97		.73	.71		.07	.07		.23	.19
1970–75		1.22	1.14		.88	.85		.08	.09		.28	.23
1975–80		1.29	1.17		.97	.92		.09	.10		.23	.15

Source: U.S. Department of Commerce, Bureau of the Census Current Population Survey Reports, P-20, Nos. 123-4.

Table 4.—Actual Number of Households, 1950 and 1961, by Type of Household and Age of Head, and Number "Expected" [1]

[Number in millions]

Type of household and age of head	Actual number		Change: 1950–61		"Expected" number in 1961 on 1950 heads [1]	Actual number minus "expected" number
	1950	1961	Absolute	Percent		
	(1)	(2)	(3)	(4)	(5)	Col. (2) minus col. (5)
All households	43.6	53.3	9.7	22.4	50.0	3.3
Under 35 years		12.3			11.0	1.3
35 to 54 years		22.5			21.7	.9
55 years and over		18.5			17.3	1.2
Husband-wife primary families	34.1	39.6	5.5	16.1	38.2	1.4
Under 35 years		10.4			10.0	.4
35 to 54 years		18.2			17.8	.4
55 years and over		11.0			10.4	.6
Other primary families with male head	1.2	1.2	0	0	1.5	−.3
Under 35 years		.2			.2	0
35 to 54 years		.5			.6	−.1
55 years and over		.5			.8	−.2
Primary head with female head	3.6	4.5	.9	25.2	4.4	.1
Under 35 years		.3			.4	−.1
35 to 54 years		2.0			1.8	.2
55 years and over		1.8			2.3	−.5
Male primary individuals	1.7	2.7	1.1	63.4	2.1	.6
Under 35 years	.2	.5			.2	.3
35 to 54 years	.6	.8			.7	.2
55 years and over	1.0	1.4			1.2	.2
Female primary individuals	3.0	5.3	2.2	73.5	3.8	1.5
Under 35 years	.3	.5			.3	.1
35 to 54 years	.8	1.1			.9	.2
55 years and over	1.9	3.7			2.6	1.1

1. Number of persons who would have been household heads of each type if the percent of such persons in each age-sex group in 1961 had been the same as in the 1950 Current Population Survey. Age groups used for computation were more detailed than those shown in this table.

Source: Adapted with some additions from Bureau of the Census Current Population Reports, Series P-20, No. 33 (3/12/51) and P-20, No. 114 (1/31/62).

holds will not suffice for recent U.S. experience. Indeed, from 1950 to 1960 non-husband-wife households increased by nearly 4 million, almost matching the 5 million advance in the husband-wife type. Increases in the latter had dominated earlier household growth, accounting for some three-fourths of the total gain from 1900 to 1950.

Among the non-husband-wife units, primary individual households were most important in the 1950–60 rise: They increased by some 3 million, or more than 60 percent, after a slower earlier growth.[9] Much of the uncertainty concerning the projection of total households lies in the question of what will happen to primary individual households—whether the rise in the past several years has been a temporary phenomenon or an emerging new trend. Some insight into this problem may be obtained from an examination of the data available on the principal characteristics of such household formation.

Table 4 provides a special tabulation by the Census Bureau of changes in households, by age and type, from 1950 to 1961. The sharp growth in primary individual households, it is clear, extended to both female and male heads. Female household heads, which had increased 64 percent from 1940 to 1950, rose even more rapidly after 1950: from 3 million to 5.3 million during this 11-year period.

Female primary individuals

The next to last column in table 4 shows for 1961 the number of households in each category that would have been in existence if, within each age-sex group, the percentage of persons who were heads of households had not changed after 1950. Under such an assumption, female primary individuals would have increased in number by some 800,000. In fact, the actual increase was 2.2 million. Thus, only one-third of the 1950–61 increase was attributable to growth in the number of women in the various age groups; two-thirds was due to an increased tendency in each age group to maintain households.

An examination of the data for the entire female population (aged 14 and over) by marital status shows that among widows, single persons, divorcées as well as married women with spouse absent there was a general increase in the tendency to maintain separate households from 1950 to 1961 (see table 5). Widows accounted for by far the greatest part of the increase in female primary individual households.

The increased tendency of women to maintain households which are not shared by relatives appears to be due chiefly to the general advance in income and asset-holdings of both the individuals and their relatives. The rise in older-women households is of particular interest in view of their relative importance. Incomes for those over 65 have been increased by retirement income from social security and other pension and annuity plans. Cross-sectional data from the 1960 Census point to a strong income effect on separate household maintenance.

The text table below classifies nonmarried persons aged 65 and over according to their living arrangements and 1959 income. Among women with incomes below $1,000 some 39 percent lived alone or with nonrelatives, while 61 percent lived with relatives. For incomes $3,000 and above, however, the ratios were about reversed.

Living arrangements	Women		Men	
	Less than $1,000	$3,000 or more	Less than $1,000	$3,000 or more
	Percent	*Percent*	*Percent*	*Percent*
Total	100	100	100	100
Living with relatives	61	38	53	42
Living alone or with nonrelatives	39	62	47	58

NOTE.—From Lenore A. Epstein "Living Arrangements & Income of the Aged, 1959" Social Security Bulletin September 1963.

Male primary individuals

Prior to 1950, male primary individuals had remained a relatively stable proportion of total households, but from 1950 to 1961 their number rose from 1.7 million to 2.7 million. If the ratio of household heads to population had been the same in 1961 as in 1950 for each age group among adult males, the rise in the number of households would have been only 400,000.

In contrast to females, the trend toward increased maintenance of households by primary males was most pronounced in the younger age groups. As in the case of the women, each of the principal marital groups of primary males showed a trend toward maintenance of a separate household from 1950 to 1961. (See table 5.)

Census projections of primary individuals

The Census projection of primary individual households makes use of the changes in the ratio of household heads to population by age and sex, from 1949–51 to 1956–58; however, for male primary individuals, the change from 1950 to 1960–62 was used. In all cases changes were tapered off after 1965.

The Census projection of primary individual households shows the recent uptrend continuing strongly through 1965 for the "A" series and somewhat

Table 5.—Heads of Primary Individual Households Related to Population, by Marital Status and Sex, 1950 and 1961

	(Millions)	
	1950	1961
Females, 14 years and over		
Widows, total number	7.0	8.2
Heads of Primary Individual Households	1.9	3.3
Percent	26.9	40.2
Single Persons	11.1	12.8
Heads	.8	1.1
Percent	7.0	8.4
Divorcées	1.2	1.9
Heads	.2	.5
Percent	16.8	27.4
Married, husband absent	1.5	2.5
Heads	.2	.4
Percent	12.9	16.2
Females (4 Group Total)	20.8	25.3
Heads	3.0	5.3
Percent	14.6	20.9
Males, 14 years and over		
Widowers	2.3	2.1
Heads	.5	.6
Percent	22.4	26.0
Single Persons	14.3	15.0
Heads	.7	1.1
Percent	4.9	6.9
Divorcés	.9	1.2
Heads	.2	.4
Percent	22.1	31.9
Married, wife absent	1.1	1.6
Heads	.2	.5
Percent	19.3	30.9
Males (4 Group Total)	18.7	20.7
Heads	1.7	2.7
Percent	8.9	13.2

Source: U.S. Department of Commerce, Office of Business Economics based on Current Population Survey, Series P-20, Bureau of the Census.

9. Primary individual households are composed of single individuals, or two or more individuals not related by blood, adoption, or marriage. Individuals in 1-person households, and the designated head of multi-person households of this type, are termed "primary individuals" by the Census Bureau. Secondary individuals in households are those who do not have their own households, but reside in households which have another "head" to whom they are not related. An adult lodger is an example of a "secondary" individual. It will be helpful to remember that the number of primary individuals equals the number of primary individual households.

Table 6.—Average Annual Change in Number of Households, by Source of Increase, Actual 1930–60, and Projections

[Thousands]

	Actual			"A"			"B"			Alternate		
	Total	Due to increased population	Other	Total	Due to increased population	Other	Total	Due to increased population	Other	Total	Due to increased population	Other
1930–40	510	510	0									
1940–50	850	630	220									
1950–60	910	620	290									
1960–70				1,130	670	460	940	670	270	1,340	670	670
1970–80				1,260	1,120	140	1,160	1,120	40	1,400		
1960–65				1,210	570	640	920	670	250	1,210	—	—
1965–70				1,050	780	270	970	780	190	1,470	—	—
1970–75				1,230	1,050	180	1,140	1,000	140	1,400	—	—
1975–80				1,290	1,190	110	1,170	1,140	40	1,400	—	—

NOTE.—Calculations based on ratios of household heads to population from Special Report P–E No. 2A for years 1930, 1940, and 1950. Totals adjusted to decennial Census levels in 1930 and 1940 and to the Current Population Series in 1950 and 1960 for comparability with the Census Projections.
Source: U.S. Department of Commerce, Office of Business Economics and Bureau of the Census.

less vigorously for the "B" series (see chart below and table 3). After 1965, the absolute advance for both series tapers off, and is again less marked after 1970.

Total Household Projections

Because the separate detailed projections reviewed above may be subject to greater error than the overall totals and because there is shifting between the two types, the following discussion will proceed on a more aggregative basis.

The projected total number of households for the "A" and "B" series based upon the methodology reviewed above is given in the text table that follows, together with an alternate series (to be discussed later) for the 1970's:

	Number of households (millions)					
	1950	1960	1965	1970	1975	1980
Actual (from Current Population Survey)	43.6	52.6				
"A" projection			58.4	63.9	70.0	76.5
"B" projection			57.2	62.0	67.7	73.6
Alternate projection				65.0	72.0	79.0

After a 9 million increase in households from 1950 to 1960, the "A" series projects an 11.3 million rise for the 1960's and 12.6 million for the 1970's. The corresponding "B" projections are 9.4 and 11.6 million.

As has been previously observed, one of the distinctive developments of the past 20 years has been the rise in the ratio of households to adult population. Prior to 1940, there was an upward trend in this ratio but it was quite weak, and reflected mainly changes in age distribution. During the past two decades, however, it has been quite general, occurring in all age groups of the adult population and especially among the younger adults, as may be seen in the chart to the right.

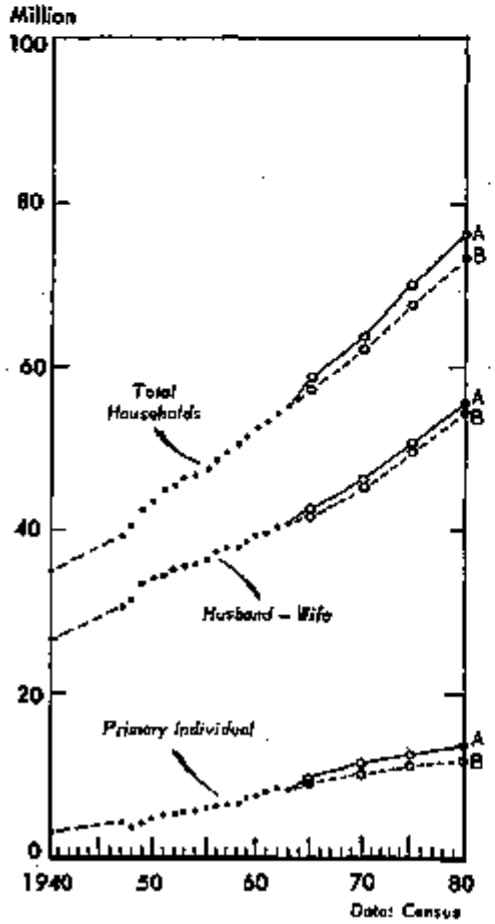
Factors in household increases

If each age group of adults had had the same proportion of household heads in 1960 as in 1950, the total number of households would have increased on the average by 620,000 per year. The actual increase was 910,000. The 620,000 increase is referred to here as a population effect. What is the importance of population and nonpopulation effects for the projected periods?

In the "A" series, as may be seen in table 6, 670,000, or a little over 60 percent of the average annual 1960–70 advance, is attributable to increased adult population and the rest to the increased ratio of household heads to adult population. For the 1970's nine-tenths of the increase is attributable to population effect.

When the 1960–70 period is broken down into two 5-year periods, it appears that for the "A" series a somewhat

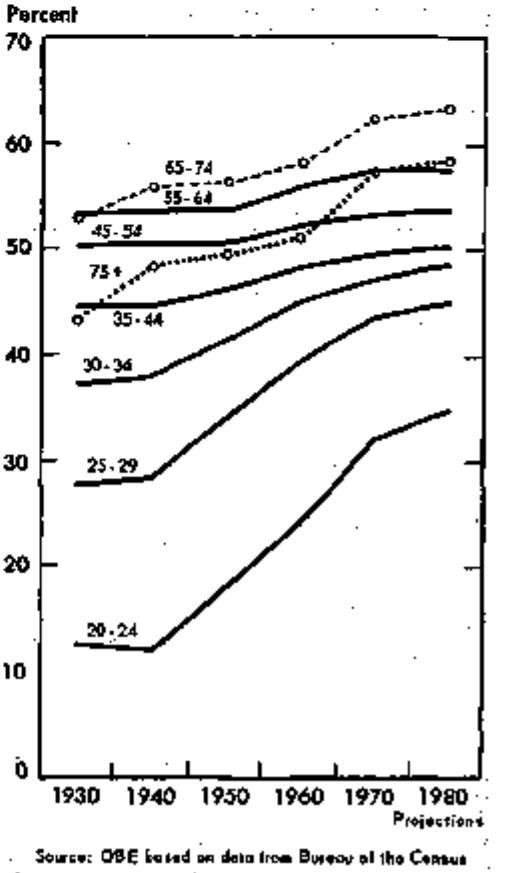
ACTUAL AND PROJECTED HOUSEHOLDS BY TYPE OF HOUSEHOLD



U.S. Department of Commerce, Office of Business Economics 63-11-7

HEADS OF HOUSEHOLDS AS % OF POPULATION IN EACH AGE GROUP ("A" Series)

Large Rise in Proportion of Household Heads Since 1940
* Smaller Change Projected After 1970



Source: OBE based on data from Bureau of the Census
U.S. Department of Commerce, Office of Business Economics 63-11-8

larger absolute rise in total households is indicated for 1960–65 than for 1965–70, even though there is a strong upsurge in the adult population after 1965. Indeed, the household rise from the population effect shows a sharp pickup over the two 5-year time periods. The projected dip in total household formation in 1965–70 comes about from the assumed slowing down after 1965 in the rise of the household-adult population ratio. It may be noted that after 1970 annual increases in households are larger than in the preceding period, as increases from population effect more than offset the influence of the assumed tapering off in the ratio of household heads to adult population.

An alternate projection

Clearly there is an upper limit to the ratio of household heads to adult population: For a variety of reasons many persons cannot or do not wish to maintain their own homes even though their economic situation might permit them to do so. Moreover, it is obvious that the great majority of households are of the type that will not be further subdivided. These circumstances will act as constraints on the rise in the household-head-adult ratio. The basic issue is one of timing.

Table 7.—Ratio of Households to Adult Population: Actual 1900–60 and Projections 1965–80

1900	0.391
1910	.389
1920	.400
1930	.409
1940	.416
1950	.448
1960	.486
Projections	
1965	
"A"	0.510
"B"	.497
1970	
"A"	.515
"B"	.500
Alternate	.524
1975	
"A"	.519
"B"	.502
Alternate	.534
1980	
"A"	.521
"B"	.503
Alternate	.538

Source: U.S. Department of Commerce, Bureau of Census and Office of Business Economics.

It seemed appropriate to add to the two Census projections a higher alternative, based on the assumption that the trend toward more households per adult will not taper off so much as that shown in the "A" series after 1965, and will continue to be important for another decade beyond 1965.[10] Even with no change in the historical average rate of growth in income and output, given the strong income effect on separate household maintenance by older persons, the possibilities of income expansion through Social Security and other pension plans appear large enough to warrant a continuation of the trend toward separate living by older persons. Special housing programs for the elderly may accentuate such a trend. If the rate of economic growth should accelerate, the establishment of households by younger adults will be an additional factor supporting increased household formation. The higher alternative would seem to be more reasonable under conditions of accelerated economic growth.

As shown in the preceding text table, the alternate household series projection is 1 million higher than the "A" series in 1970 and 2 million higher in 1975. This higher series shows some pickup in the percentage rate of household growth relative to adult population in the 1970's. Historical and projected summary ratios may be found in table 7.

Part II—From Household Projections to New Housing Units

PART II of this study provides projections of (1) changes in vacancies, and (2) losses or removals from the housing inventory. Estimates for these two categories, together with the projections of households—that is, the stock of occupied housing units—make possible an estimate of units of new housing construction. The projections discussed in this part are related specifically to the "A" household projections; in the summary table on page 9, however, separate estimates of vacancies and losses are shown for the lower and higher projections of households.

Vacancies

Although conceptually a vacant housing unit appears to be a simple statistic, the existence of numerous types of vacancies and the paucity of historical data have prevented the development of a meaningful vacancy analysis. A breakdown of vacancies into the various types is available, however, from the 1950 Housing Census, and in the current quarterly vacancy series published by the Census in the current housing reports beginning in 1955. These data are shown in table 8.

Types of vacancies

The statistic which is the object of the present inquiry is the gross vacancy rate, or the complement of the ratio of occupied housing units to total housing inventory. This rate rose from 7 percent in 1950 to 8 percent in 1955 and continued upward, reaching 10 percent about 1958. Since then the rate has remained at this level with only minor fluctuations.

Part of the increase in total vacancies since 1950 has been in "seasonal" units—from a 2.5 percent rate to 2.9 percent in the second quarter of 1963. Because these units consist primarily of vacation homes and units occupied temporarily by persons who maintain a usual residence elsewhere, their rise since 1950 was very likely not a reflection of a weakening in the housing market but, on the contrary, just the

10. This alternative projection is presented even though in the current period households are at the approximate level of the "B" series.

reverse. While the tendency is still not widespread, an increasing proportion of families have purchased vacation homes as their incomes have risen. This situation is analogous to the multiple ownership of automobiles, which has become an important element in the growth of the car population.

Dilapidated units have constituted about 1 percent of total vacancies. In recent years they have shown a slight downward trend, but too much significance should not be attached to these minor changes. Rising incomes will tend to reduce the total of such units; they may be demolished, and thus removed from the housing stock, or they can be rehabilitated, and thus taken out of the dilapidated category.

Among the nonseasonal, nondilapidated units are two categories which are not directly available as part of the housing supply: units which have already been rented or sold and are awaiting occupancy, and units held off the market for other reasons. For the two categories combined, vacancies this year were some 3 percent, up somewhat from the early 1950's. Under normal supply-demand conditions, it seems reasonable that this group should constitute a fairly constant proportion of the total housing inventory; the rise in the ratio since the early 1950's probably reflects the disappearance of the very tight housing market since the early postwar period.

The final category—"available" nonseasonal, nondilapidated units—constitutes that portion of the vacancies most closely related to housing demand. The vacancy ratio for such units was as low as 1.6 percent of the stock in 1950, when shortages were widespread; it climbed to 2.3 percent by 1955, and then continued upward until about 1960, when it reached a 3.5 percent rate. Since that time, there has not been much change in this proportion.

Rental and homeowner vacancies

Vacant units available for rental have been two to four times higher than those available for sale throughout the period of the current vacancy series. When vacancies of each type are related to their respective stocks, it appears that the homeowner vacancy rate in 1960 was 1.6 percent and the rental vacancy rate 6.7 percent. Except for the very early postwar period, there has always been a substantial difference in the rates. For the existing properties, this difference reflects more rapid turnover for renters than for owners.

Projection of vacancy rates

A small rise in the vacancy proportion has been projected over the next several years from 9.4 percent in 1960[11] to 9.8 percent in 1970 and 10.2 percent in 1980. In terms of units, vacancies are projected to rise by 1.6 million in the period 1965–75 as compared with a 2.3 million rise from 1950 to 1960. The projected total vacancy rate was built up from the component parts just discussed.

(1) Seasonal units are expected to increase their proportion of the total housing inventory, extending the moderate upward trend of the past decade.

(2) Dilapidated units are expected to represent a declining share of the inventory as a result of disappearances and rehabilitation.

(3) Nonseasonal nonavailable units are assumed to remain a constant proportion of the inventory.

(4) Nonseasonal available vacant units are expected to represent a slightly rising share of the total stock.

The vacancy series indicate that projected vacancies should be higher if the proportion of rental units increases. The projection provides for little change in the rental proportion of the housing stock. Since 1940 there has been a strong movement toward home ownership—from 44 percent to 62 percent in 1960, but there is some evidence that the rate of increase has been tapering recently. For the 1965–75 projections the trend toward home ownership associated with rising income is expected to be about offset by increased demand for rental quarters by young adults and elderly persons.

Losses

Units are removed from the housing stock for a variety of reasons—for instance, because of fire, flood, and other disasters; road-building and other programs of government authorities; demolition to make way for new units; and conversion to nonresidential use.

Removals from the housing stock are equivalent to the replacement market for residential construction. Since they are such an important part of the housing picture, attempts at measurement have been made over a long period of years.[12] Nevertheless, the statistical problems of obtaining a useful measurement of losses are great. The data available before 1950 are not directly useful for projection purposes. In addition, the 1940–50 period was such an abnormal one for housing that the experience of that decade may not be directly helpful in the present analysis of housing prospects.

11. This rate is from the decennial Census. It is a little lower than the second quarter 1960 rate shown in table 7, which is the current quarterly series.

12. For summaries and references, see Sherman Maisel, "Importance of Net Replacements in Housebuilding Demand," *Study of Mortgage Credit*, U.S. Senate Committee on Banking and Currency, Subcommittee on Housing, 85th Congress, 2d Session. Washington 1958. Sherman Maisel and L. Grebler, "Determinants of Residential Construction," Research Study 4 in Commission on Money and Credit, *Impacts of Monetary Policy*. New York 1962.

Table 8.—Housing Occupancy and Vacancy Rates

	April 1950	Second quarter								
		1955	1956	1957	1958	1959	1960	1961	1962	1963
All dwelling units	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0
Occupied	93.1	91.9	91.3	90.9	90.2	89.6	88.8	89.7	89.9	89.8
Seasonal	2.5	2.6	2.5	2.8	3.0	3.0	2.7	2.5	2.6	2.9
Year-round vacant	4.4	5.5	6.2	6.3	6.8	7.4	7.5	7.8	7.5	7.3
Dilapidated	1.1	1.2	1.0	1.2	1.2	1.3	1.1	0.9	1.0	0.8
Not dilapidated	3.3	4.3	5.2	5.0	5.6	6.1	6.4	6.9	6.5	6.5
Rented or sold [1]	1.7	0.5	0.5	0.5	0.5	0.5	0.4	0.5	0.5	0.5
Held off market	[1]	1.5	2.1	2.2	2.3	2.4	2.5	2.6	2.5	2.5
Available	1.6	2.3	2.6	2.3	2.0	2.2	3.5	3.8	3.5	3.5
For rent	1.1	1.8	2.1	1.8	2.3	2.5	2.8	3.0	2.7	2.7
For sale	0.5	0.5	0.5	0.5	0.0	0.7	0.7	0.8	0.8	0.8

1. Awaiting occupancy.

Source: U.S. Department of Commerce, Bureau of the Census.

Gross and net changes, 1950–59

The housing inventory surveys by the Census Bureau, covering the inventories as of April 1950 and the end of 1956, and 1959, provided for the first time a comprehensive and consistent set of statistics on the components of housing inventory change. Results of these surveys are presented in table 9. The gross character of the component changes in this table should be kept in mind.

From April 1950 to December 1959 *gross* additions to the housing inventory totaled 20 million units, of which some 15.5 million came from new construction. Units created by conversion—for example, from a single large unit to two or more smaller units—totaled 1,966,000; the source of these additions was the 962,000 conversions listed under "Removals." The opposite process—the merger of smaller units into larger ones—brought about a gross addition of 1,005,000 units, from a consolidation of 2,060,000 units shown as mergers under removals. The "other additions" category includes houses added by conversion from nonresidential use, miscellaneous additions, and 500,000 units that were relocated. These 500,000 units "added" through relocation are also included under "other removals."

Demolitions, by government authorities and private builders, accounted for almost 2 million out of some 7½ million units removed under these definitions. The "other removal" category, 2.6 million, includes among other things losses from accidents and disasters; from condemnation; and from change to nonresidential use.

Table 9.—Gross Additions and Removals from Housing Inventory, April 1950 to December 1959

[Thousands of units]

	(1) April 1950–December 1956	(2) December 1956–December 1959	(3)=(1)+(2) April 1950–December 1959
Additions, total	13,488	6,867	19,976
New construction	10,920	4,540	15,460
Conversion	1,376	590	1,966
Merger	649	356	1,005
Other	943	601	1,544
Removals, total	4,533	3,435	7,968
Demolition	1,131	791	1,922
Conversion	663	294	962
Merger	1,321	739	2,060
Other	1,413	1,211	2,624

Source: U.S. Dept. of Commerce, Bureau of the Census.

Definition of losses

Figures from table 9, taken in conjunction with the statistics on total housing inventory at the beginning of the period, are used in this report to calculate a net loss rate. This rate, times beginning 1960 and 1970 housing stock, yields an estimate of net losses for the 1960–70 and 1970–80 periods, respectively. Net losses are here defined as the sum of demolitions plus "other losses" minus "other additions."

It may be noted that conversions and mergers have been excluded from the above calculations. The assumption is made in this report that the two will continue to be offsetting in the period ahead, as they were during the decade of the 1950's. Although data on conversions and mergers for earlier periods are far from satisfactory, the available scraps of evidence suggest that conversions to housing units exceeded mergers. During the war and immediate postwar years, the conversion of large housing units into apartments was a significant positive influence upon the number of residential units. It seems reasonable that as the number of large houses—as well as large families—declined, and the war and immediate postwar scarcity of houses ended, the net addition of units by conversion declined.

Projection of losses

It did not appear feasible to make projections of the separate components of losses, although a few qualitative generalizations are possible relating to the changes to be expected from the decade of the 1950's. Accidental and disaster losses, for example, would seem to be a roughly constant percentage of the housing supply, to judge from data on fire losses. Losses from road-building and slum clearance programs will undoubtedly rise but there are no firm figures on urban renewal and other government programs which would permit a calculation of such removals. For the past several years there has been a net loss of residential units to nonresidential uses—the conversion of a home to an office, for example—a movement governed by relative demands for nonresidential as against residential space. A strong long-term growth in commercial and service activities suggests a continuance of such an upward trend. Finally, removals by private builders to make way for new residential units are likely to continue to grow as housing demand rises and the number of aged and deteriorating units increases.

It was decided to use an overall net loss rate based on recent experience—specifically, the 1957–59 rate of 8½ percent. Some consideration was given to using the rate applicable to the entire decade of the 1950's, but the existence within the period of clearcut differences that appear explainable suggested the use of a figure from the later period.

In table 10 the actual losses as defined here, for each period, 1950–56 and 1957–59, have been shown as 10-

Table 10.—Removals from Housing Inventory as Percent of Beginning of Period Inventory

	April 1950–December 1956		December 1956–December 1959		April 1950–December 1959	
	(Numbers in thousands)					
	Number (decade rate)	Percent of beginning inventory[1]	Number (decade rate)	Percent of beginning inventory[2]	Number (decade rate)	Percent of beginning inventory[1]
Removals:						
Demolitions	1,676	2.6	2,637	4.8	4,271	6.3
Other losses	2,093	4.6	4,096	7.3	2,691	5.9
Total	3,769	8.2	6,673	12.1	4,883	10.1
Less: Other additions	1,397	3.0	2,092	3.8	1,384	3.4
Equals: Net removals	2,372	5.2	4,570	8.4	3,078	6.7

1. April 1950 inventory, 45,886,000.
2. December 1956 inventory, 55,337,000.

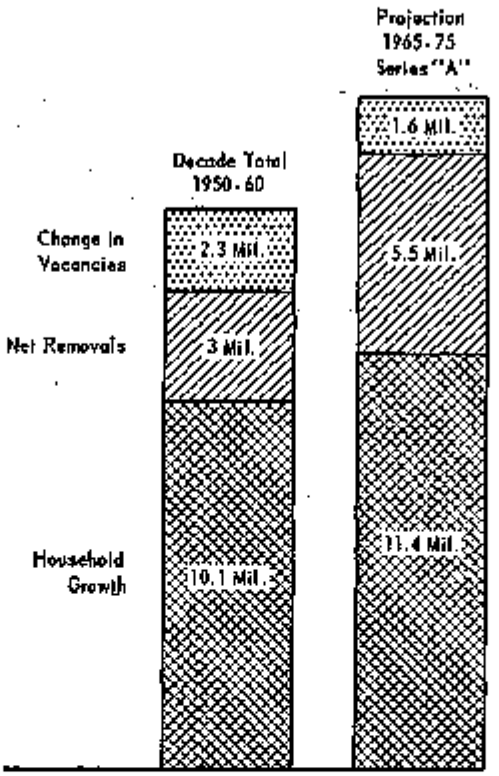
Source: U.S. Department of Commerce Bureau of the Census. Calculations by OBE from data contained in table 9.

year rates and then expressed as percentages of the housing inventory at the beginning of the respective periods. Removals rose from 8.2 to 12.1 percent; after subtraction of "other" additions, the net loss shows a rise from 5.2 to 8.4 percent. Similar calculations yield a 6.7 percent rate for the entire decade.[13] The experience of the last few years of the 1950's seems to be more applicable than the entire decade to the period ahead because of the existence of housing shortages in the first part of the 1950's.

There was a possibility that losses from 1957 through 1959 were unusually large because they had been unduly low in the previous 6½ years as a result of the housing shortages. It appears, however, that while increases in the loss rate were general throughout the country, the most pronounced increases in this rate occurred outside of metropolitan areas, especially in the less urbanized parts of the South and West. This development appears to be related in part to the shift of population out of rural areas and the abandonment of old houses in such places.

An 8½ percent net loss rate, applied to the inventory of occupied and vacant housing units at the beginning of 1960, yields net losses of 5 million units for the 1960–70 period, and by a similar procedure, a total of 6 million losses for the period 1970–80.[14]

SOURCES OF NEW HOUSING DEMAND



Data: Census
Projections: Households, Census; Other, OBE
U.S. Department of Commerce, Office of Business Economics 63-11-9

Population shifts and housing demand

Geographical shifts in the population may lead to a maldistribution between the location of housing and the demand for housing accommodations. Specifically, areas which experience a substantial decline in population may have a large number of housing units which are not a part of the effective supply. Poorly located housing may show up as vacancies; or they may disappear completely from the housing inventory, and thus may be recorded under removals in the context of this analysis. Because the effects of such geographical shifts have been subsumed in the framework of this article the only question is whether proper quantitative allowance for them has been made. In effect the analysis implicitly assumes that the historical trend in population shifts will continue. An additional net increase in housing will be required only if there is an acceleration in the population shifts.

13. A slightly lower loss rate for the decade 1960–69 is obtained if a direct comparison is made between the two decennial Censuses, rather than making use also of the 1956 National Housing Inventory data as is done here and in tables B and 10. The 3.1 million loss for the decade as shown in table 9 is reduced to 2.8 million by the alternative computation. The summation of the results of the three separate surveys is considered to be the superior method because some newly constructed units may disappear very quickly, and thus be missed in a comparison spanning a full decade.

14. Results of other recent studies are as follows: (1) National Association of Home Builders "Housing Replacement Demand in the '60s" Special Report 63-5, July 12, 1963. Net losses of 4.7 million are projected for the 1960–70 decade. (2) Resources for the Future "Resources in America's Future" Johns Hopkins Press 1963. Net losses are projected for 1960–70 to range from 5 million (low) to 10 million (medium) to 18 million (high), based on projected death rates of houses by age of structure. The higher estimates appear to reflect some welfare or "standards" consideration. (3) Maisel, in "Study of Mortgage Credit," who did not have the 1960 Census data available, made lower projections than those quoted above.